

Application No. 10/734,485  
Amendment dated September 12, 2006

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The following listing of the claims is provided in accordance with 37 C.F.R. 1.121:

1. (Currently Amended) A water softener comprising:  
a cation exchange resin tank fluidly coupled for discharging spent brine comprising monovalent and divalent ions;  
a fluid mixer valve coupled to the resin tank and to a water tank to dilute the spent brine to a desired concentration of a regenerant salt;  
an ion-separation device fluidly coupled to the fluid mixer valve to receive the dilute spent brine and separate the diluted spent brine into first and second streams, the first stream substantially comprising monovalent [inns] ions and the second stream substantially comprising divalent ions; and  
a reverse osmosis (RO) membrane fluidly coupled to the ion-separation device to receive the first stream from the ion-separation device and produce a concentrate stream of monovalent ions and substantially demineralized water;  
wherein the concentrate stream of monovalent ions is collected for reuse as regenerant salt.
2. (Original) The water softener of claim 1 wherein the ion-separation device comprises a nanofiltration membrane.
3. (Currently Amended) The water softener of claim 1 further comprising a [thank] tank for the collection of the regenerant salt, wherein the tank is connected to the cation exchange resin tank for regenerating said resin.
4. (Previously Amended) The water softener of claim 2 wherein the second stream comprises a dischargeable stream comprising hardness-causing ions.

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5. (Original) The water softener of claim 1 wherein the monovalent ions are selected from the group consisting of sodium and chloride.

6. (Original) The water softener of claim 1 wherein the divalent ions are selected from the group consisting of calcium, magnesium and carbonates.

7. (Canceled)

8. (Canceled)

9. (Canceled)

10. (Canceled)

11. (Canceled)

12. (Previously Amended) The water softener of claim 1 wherein said water tank is coupled to receive the demineralized water from said RO membrane.

13. (Original) The water softener of claim 12 wherein said water tank is coupled to the fluid mixer valve to supply water for diluting the spent brine.

14. (Previously Amended) The water softener of claim 1 further comprises a pump device fluidly coupled to draw liquid through the fluid mixer valve from a spent brine holding tank and said water tank, said liquid to be delivered to the ion-separation device.

15. (Canceled)

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16. (Previously Amended) The water softener of claim 1 wherein said regenerant salt comprises sodium chloride.

17. (Previously Amended) A method for purifying and recycling spent brine in a water softener, the method comprising:

discharging from a cation exchange resin tank spent brine comprising monovalent and divalent ions;

diluting the spent brine to a desired concentration of a regenerant salt;

separating the diluted spent brine into first and second streams, the first stream substantially comprising a diluted stream of monovalent ions and the second stream substantially comprising divalent ions; and

filtering said first stream for providing a concentrated stream of monovalent ions and a stream of substantially demineralized water.

18. (Canceled)

19. (Previously Amended) The method of claim 17 wherein the second stream comprises a dischargeable stream comprising hardness-causing ions and said method further comprises discharging said second stream to a sewer.

20. (Previously Amended) The method of claim 17 wherein said concentrated stream of monovalent ions comprises a regenerant stream.

21. (Original) The water softener of claim 17 wherein said regenerant salt comprises sodium chloride.